wiring diagrams

AIR-COOLED CONDENSING UNITS SPLIT-SYSTEM HEAT PUMP UNIT

569D/569F/ 566E/576C
Sizes 072 to 120

Cancels: WD 569D.72.2

WD 569D.72.3
6/15/03

DIAGRAM INDEX

UNIT	VOLTAGE-PHASE-HERTZ	LABEL DIAGRAM	FIGURE NO.
569D072	208/230-3-60	38AK540117	1 or 2*
	460-3-60		
	575-3-60	38AK540119	3 or 4*
569D090-120	208/230-3-60	38AK540116	5 or 6*
	460-3-60		
	575-3-60	38AK540118	7 or 8*
576C090-120	208/230-3-60	38AK540120	9 or 10*
	460-3-60		
	575-3-60	38AK540121	11 or 12*
569F120	208/230-3-60	38AK540312	13 or 14*
	400/460-3-60		
	575-3-60	38AK540313	15 or 16*
566E150-240	208/230-3-60	38AE510013	17
	400/460-3-60		
	575-3-60		

*Units produced after 03/31/03.

ACCESSORY WIRING		
Description	**Unit**	**Figure No.**
Motormaster® Control Wiring	569D072-120	18
	576C090-120	19
	569F120	20
	566E150-240	21

NOTE: Operating sequence is on page 22.

LEGEND

AHA — Adjustable Heat Anticipator
C — Contactor, Compressor
CAP — Capacitor
CB — Circuit Breaker
CC — Cooling Compensator
CH — Crankcase Heater
CLO — Compressor Lockout
COMP — Compressor Motor
COTP — Compressor Overtemperature Protection
CR — Control Relay
DGT — Discharge Gas Thermostat
EQUIP — Equipment
FCPS — Fan Cycling Pressure Switch
FU — Fuse
GND — Ground
HPS — High-Pressure Switch
IFC — Indoor-Fan Contactor
LLS — Liquid Line Solenoid
LLSV — Liquid Line Solenoid Valve
LPS — Low-Pressure Switch
NEC — National Electrical Code
OFM — Outdoor-Fan Motor
OFR — Outdoor-Fan Relay
OL — Overload Relay
QT — Quadruple Terminal
R — Relay
TB — Terminal Block
TC — Thermostat-Cooling
TH — Thermostat-Heating
TRAN — Transformer

Field Splice

Marked Wire

Terminal (Marked)

Terminal (Unmarked)

Terminal Block

Splice

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To Indicate Common Potential Only, Not Represent Wiring

NOTES FOR FIG. 1 AND 2

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostats: HH07AT170, 172, & 174
   Subbase HH93AZ176, 177, & 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. TRAN is wired for 230 v unit. If unit is to be run with 208 v power supply, disconnect BLK wire from 230 v tap and connect to 208 v tap.
6. Three-phase motors are protected under primary single phasing conditions.

NOTES FOR FIG. 3, 4, 7, 8, 11, 12

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172, & 174
   Subbase: HH93AZ176, 177, & 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. Three-phase motors are protected under primary single phasing conditions.

NOTES FOR FIG. 5, 6, 9, 10

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172, & 174
   Subbase: HH93AZ176, 177, & 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. TRAN is wired for 230 v unit. If unit is to be run with 200 v power supply, disconnect BLK wire from 230 v tap and connect to 200 v tap.
6. Three-phase motors are protected under primary single phasing conditions.

VOLTAGE RATING	CB Mfg. Part No.	MUST TRIP AMPS
24 V	Potter & Brumfield W28X-1024-3.2	3.2

NOTES FOR FIG. 13 AND 14

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172, 174 & P272-2783
   Subbase: HH93AZ176, 178 & P272-1882, 1883 or HH93AZ177 & 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. If TRAN is wired for 230 v unit and unit is to be run with 200 v power supply, disconnect BLK wire from 230 v tap and connect to 200 v tap.
6. If TRAN is wired for 460-3-60 v and unit is to be run with 400-3-50 v power supply, disconnect BLK wire from 460 v tap and connect to 400 v tap.
7. Three-phase motors are protected under primary single phasing conditions.

VOLTAGE RATING	CB Mfg. Part No.	MUST TRIP AMPS
24 V	Potter & Brumfield W28X-1024-3.2	3.2

NOTES FOR FIG. 15 AND 16

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Thermostat: HH07AT170, 172, 174 & P272-2783
   Subbase: HH93AZ176, 178 & P272-1882, 1883 or HH93AZ177 & 179.
3. Sealed VA for IFC and LLSV is not to exceed 22.
4. Use copper conductors only.
5. Three-phase motors are protected under primary single phasing conditions.

VOLTAGE RATING	CB Mfg. Part No.	MUST TRIP AMPS
24 V	Potter & Brumfield W28X-1024-3.2	3.2

NOTES FOR FIG. 17

1. Fan motors are thermally protected — three-phase motors are protected against primary single phasing conditions.
2. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
3. Terminal Block 2 (TB2) is for field external control connections, Class 2 wiring: supply voltage at TB2 is 24 vac.
   Maximum power available at TB2 is 31.5 va.
4. Field-supplied component ratings:
   IFC sealed coil rating (24 vac) 12 va max.
   LLS sealed coil rating (24 vac) 18 va max.
   Minimum thermostat electrical rating is 120 va (5 amp — 24 vac)
   Minimum fan switch electrical rating is 60 va (2.5 amp — 24 vac)
5. LLS, liquid line solenoid, controlled by TC2, activates one half of evaporator for capacity control feature.
6. Use copper, copper-clad aluminum or aluminum conductors for field power supply only.
7. Insulate unused lead when changing tap for 208 volt use.
8. For field wiring “use 60 degree Centigrade rated wire”.

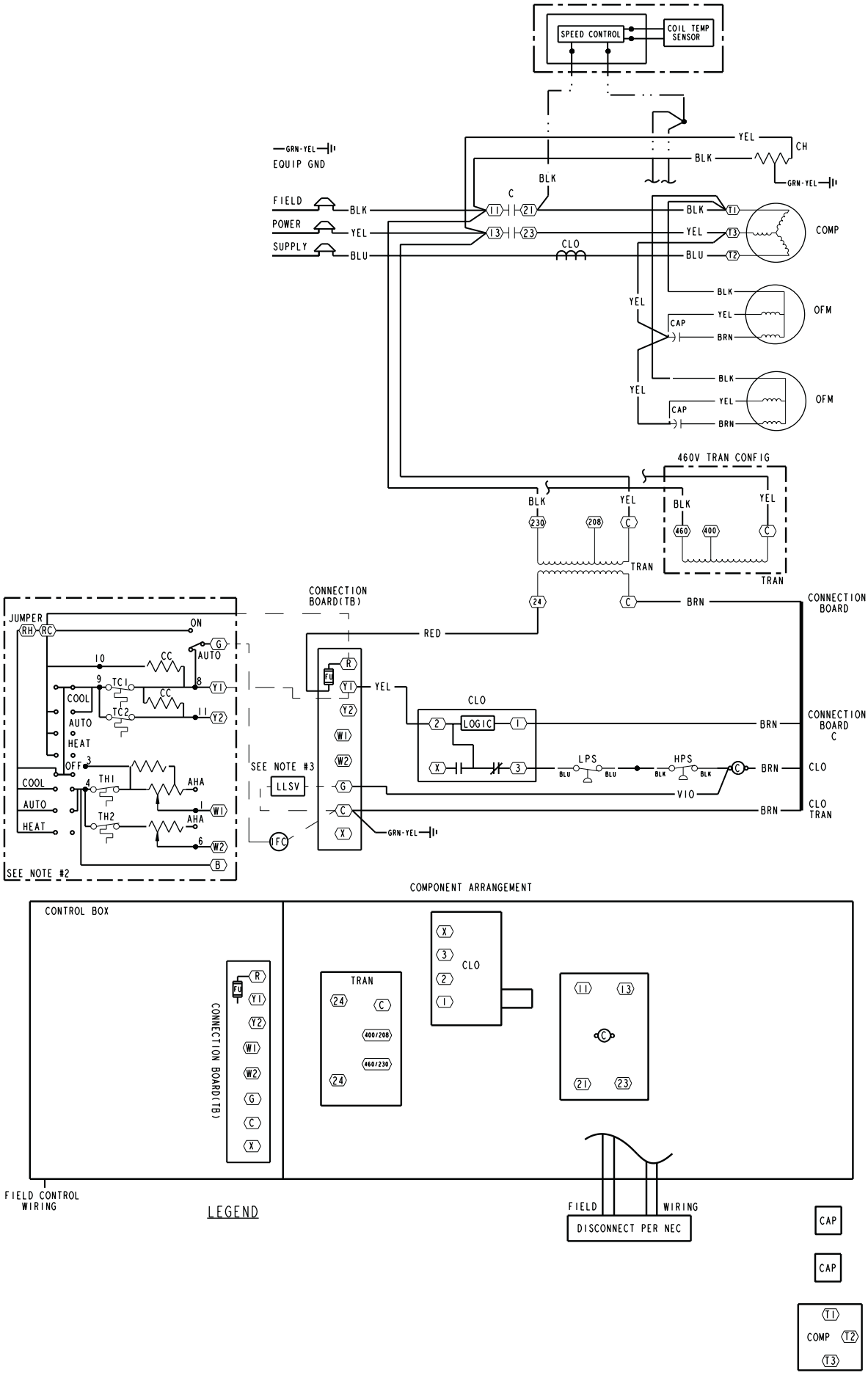


Fig. 1 — Label Diagram — 569D072, 208/230-3-60, 460-3-60 Units Produced Before 3/31/03

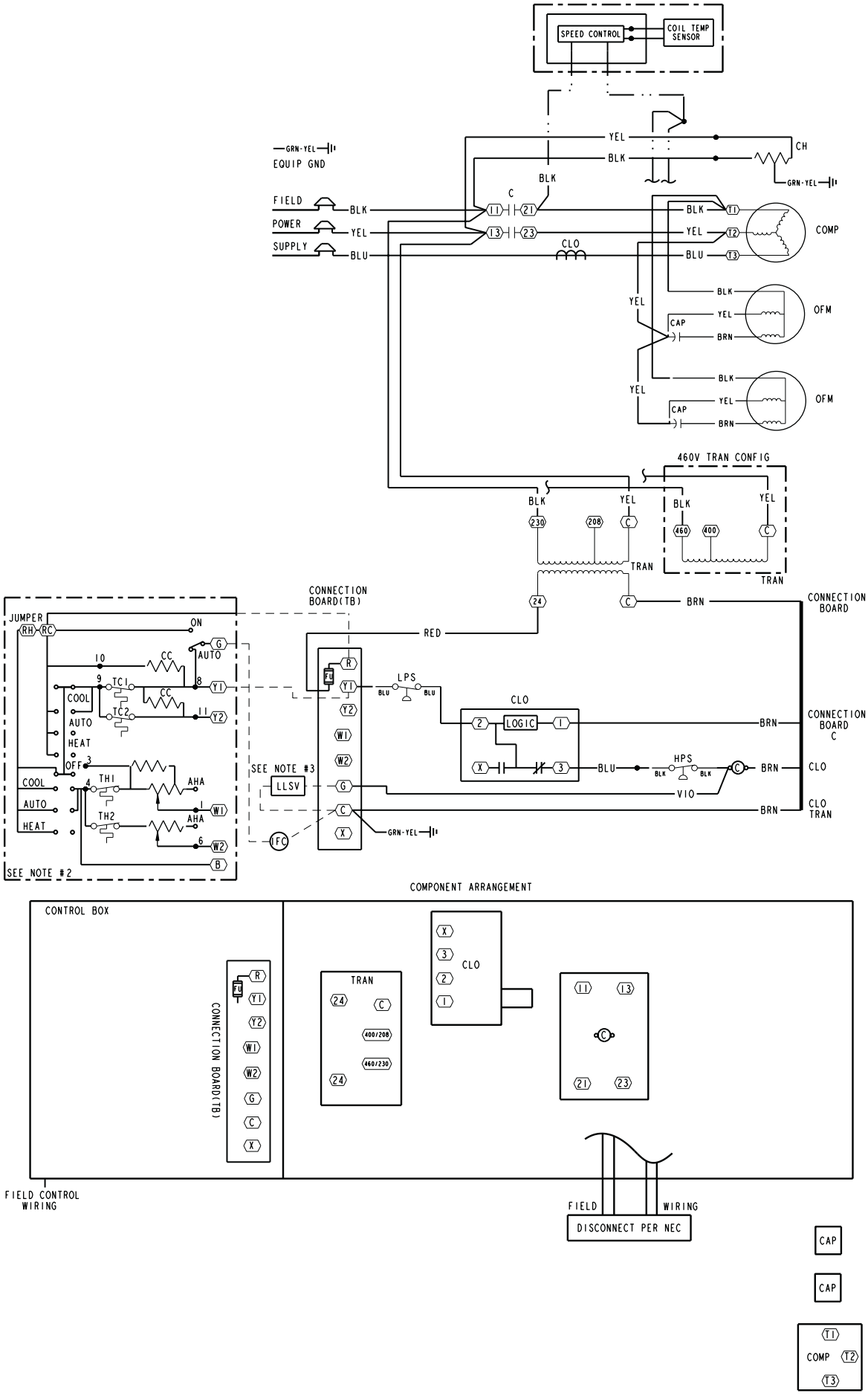


Fig. 2 — Label Diagram — 569D072, 208/230-3-60, 460-3-60 Units Produced After 3/31/03

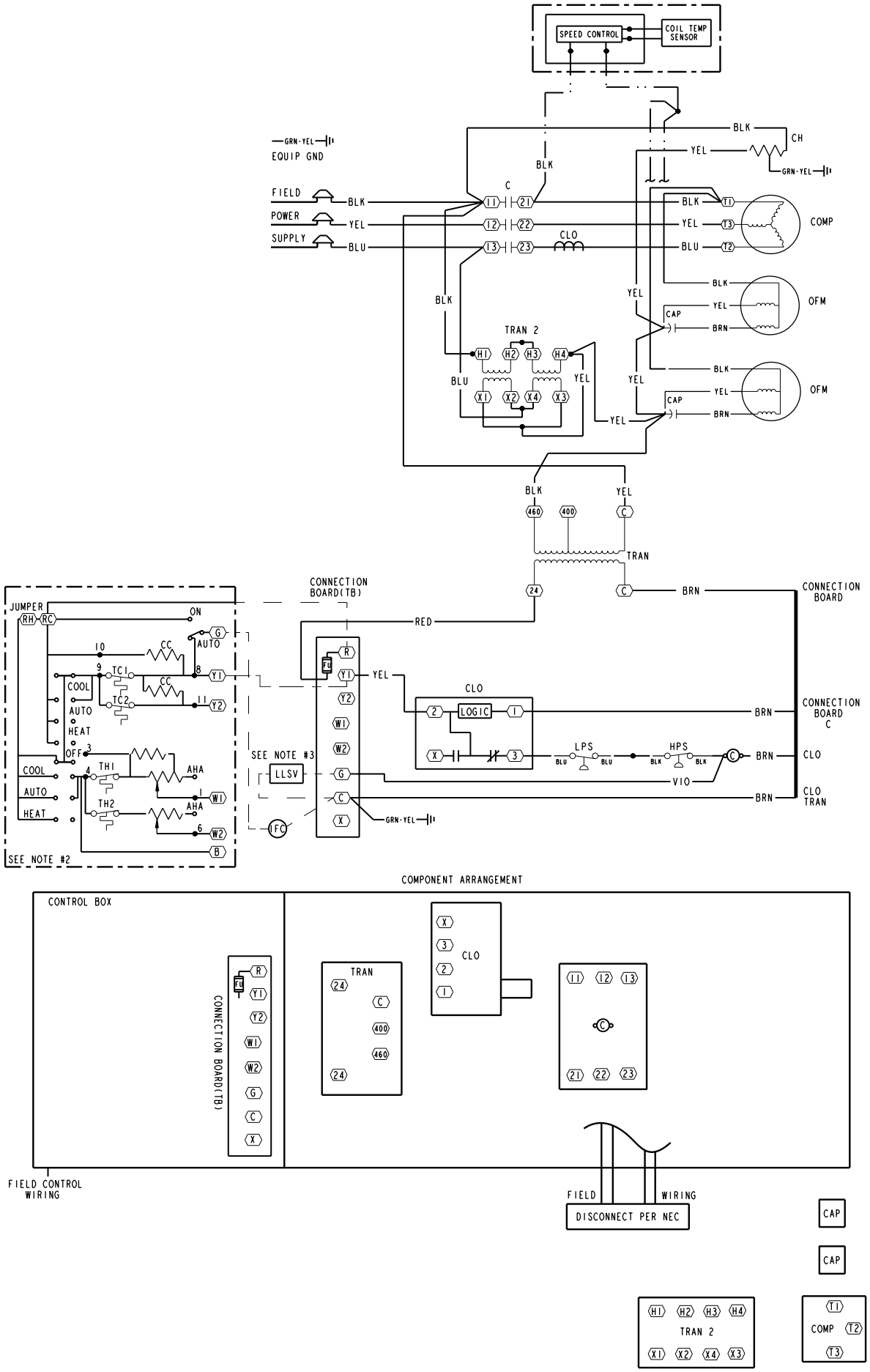


Fig. 3 — Label Diagram — 569D072, 575-3-60 Units Produced Before 3/31/03

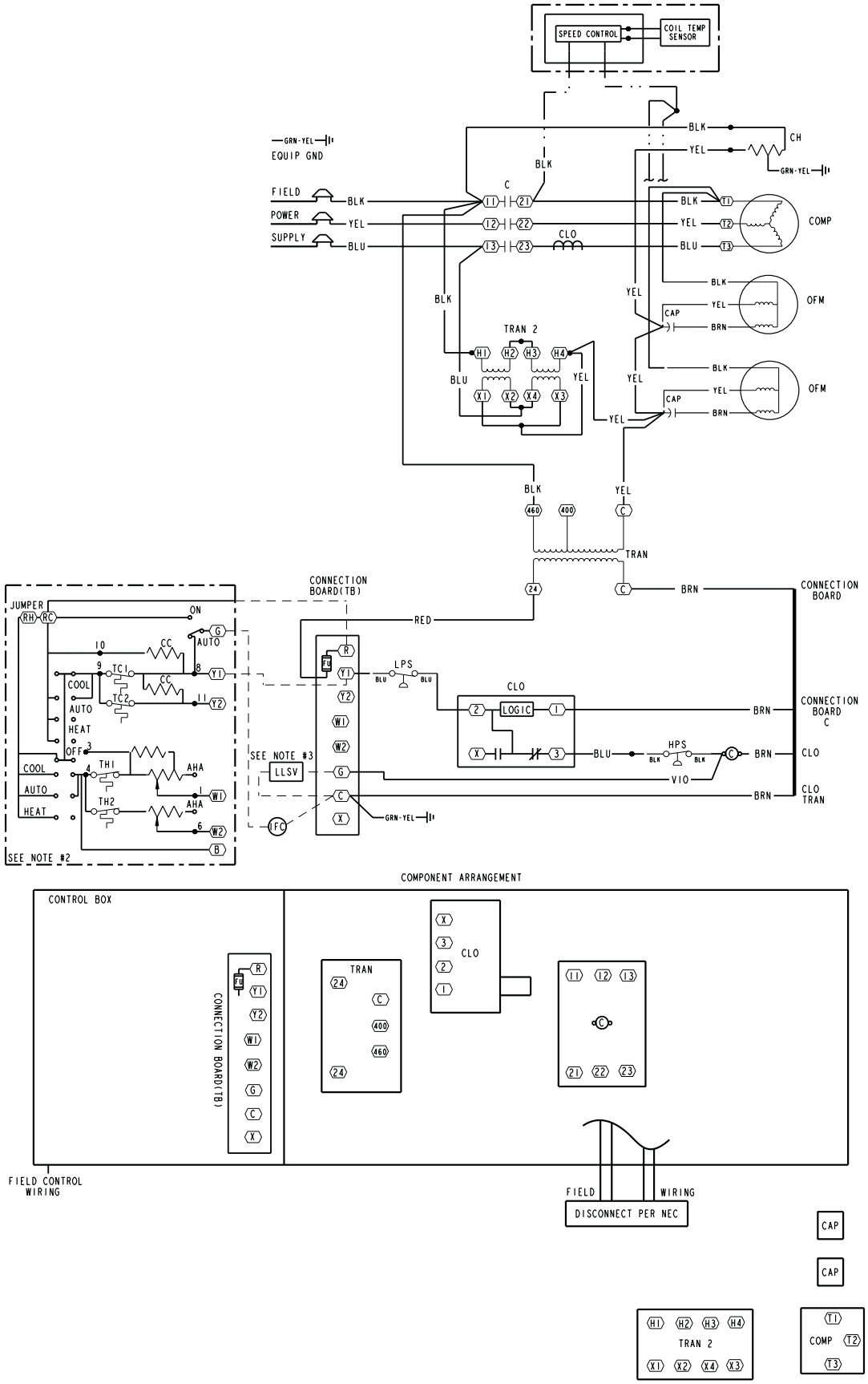


Fig. 4 — Label Diagram — 569D072, 575-3-60 Units Produced After 3/31/03

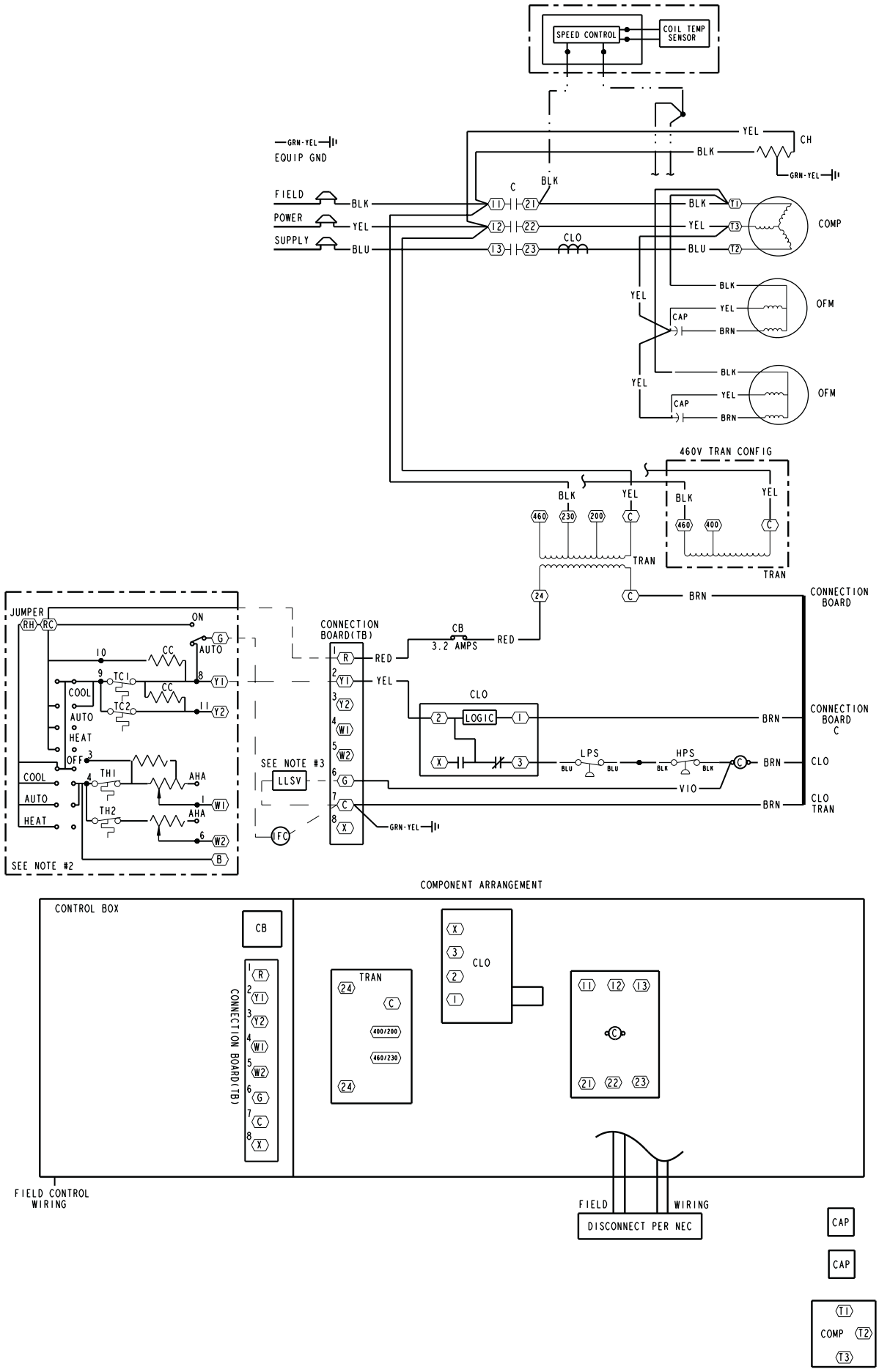


Fig. 5 — Label Diagram — 569D090-120, 208/230-3-60, 460-3-60 Units Produced Before 3/31/03

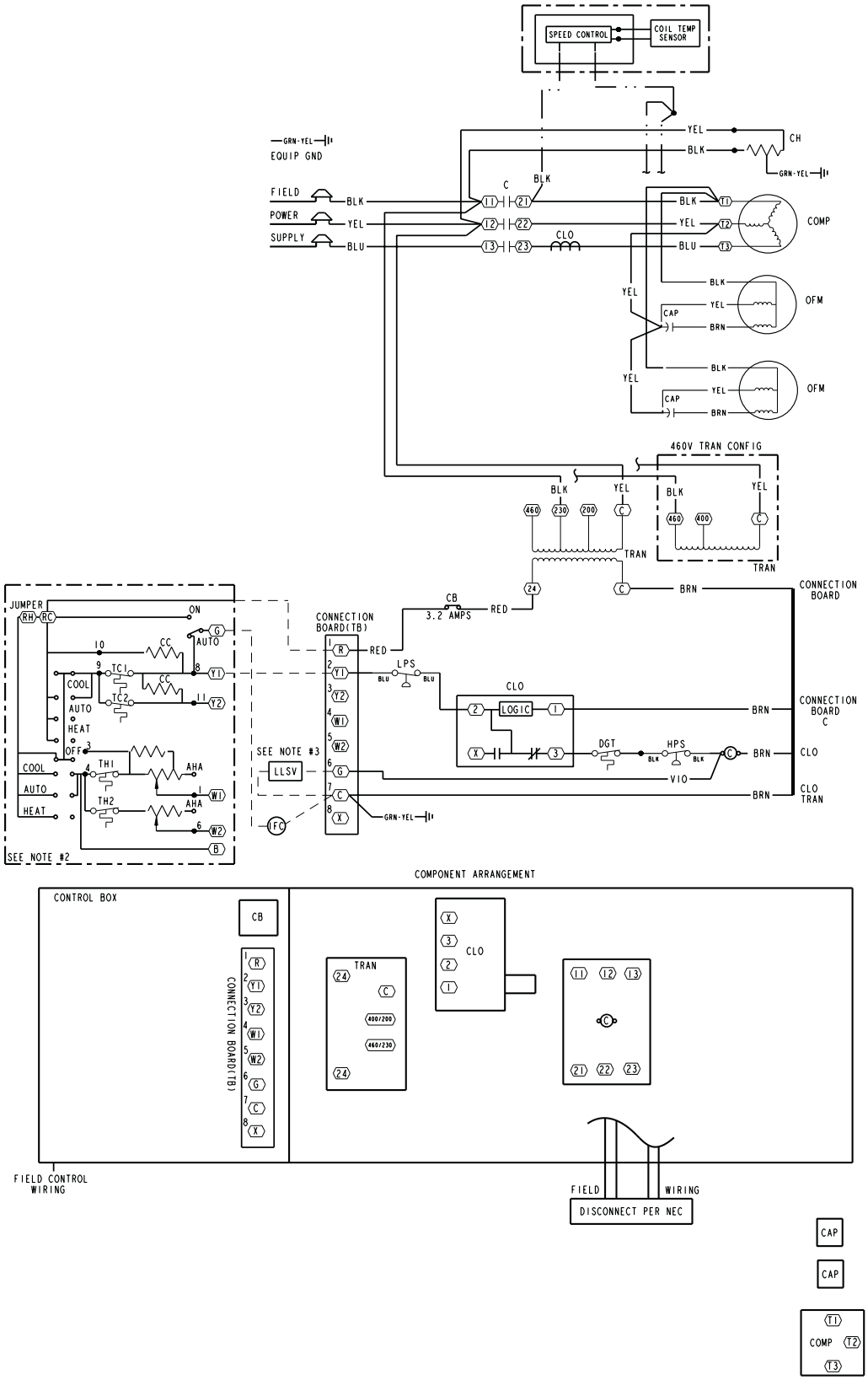


Fig. 6 — Label Diagram — 569D090-120, 208/230-3-60, 460-3-60 Units Produced After 3/31/03

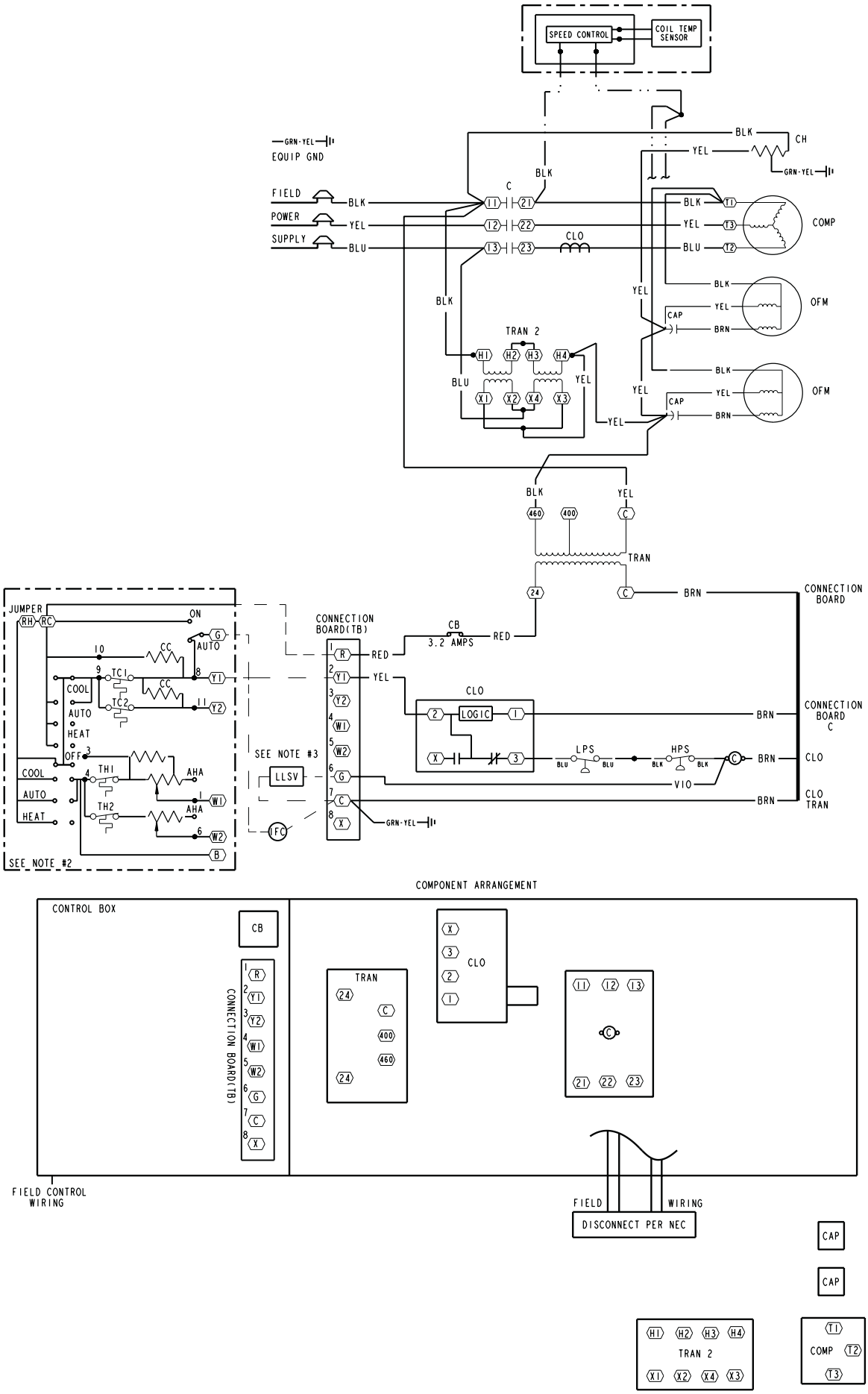


Fig. 7 — Label Diagram — 569D090-120, 575-3-60 Units Produced Before 3/31/03

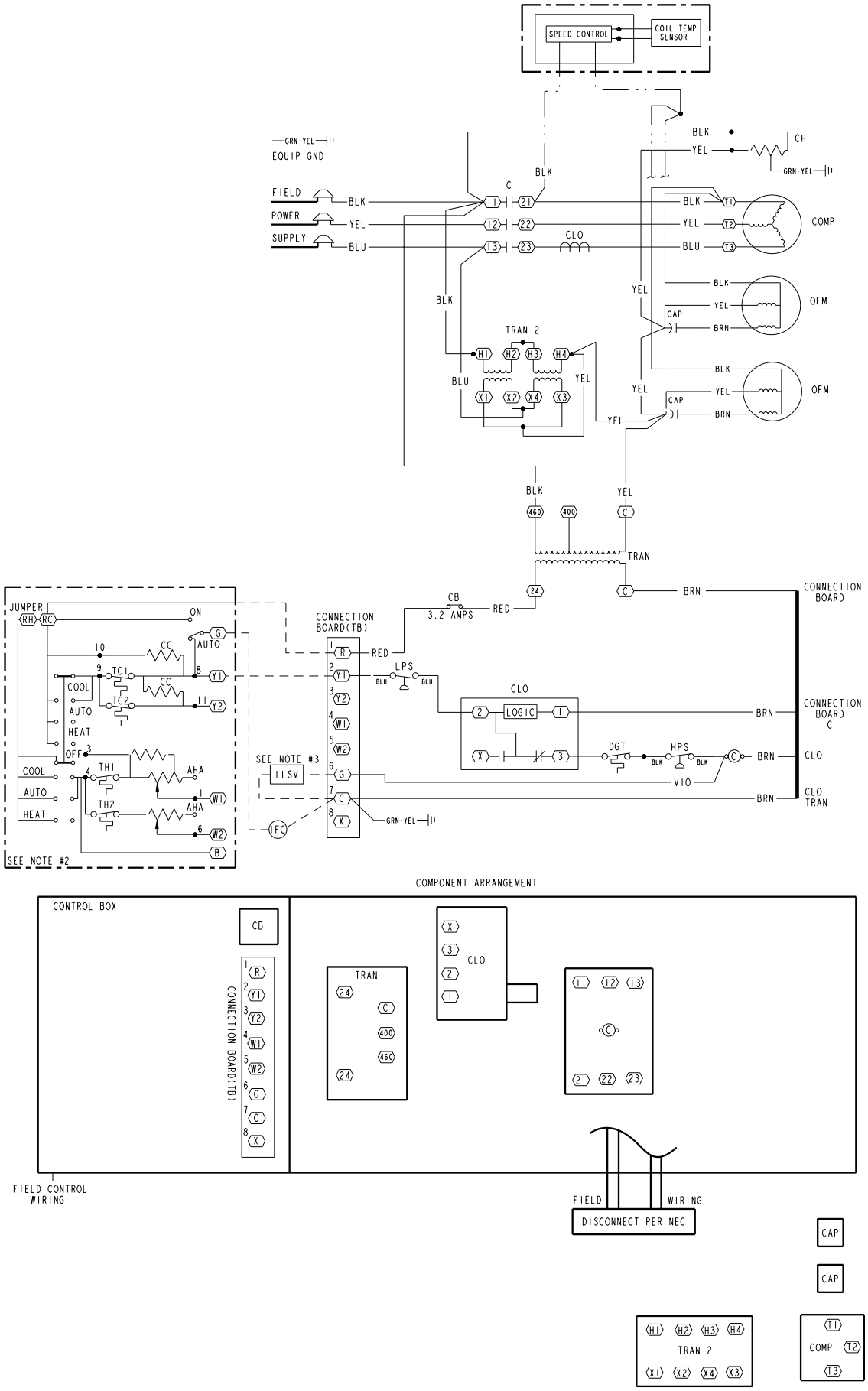


Fig. 8 — Label Diagram — 569D090-120, 575-3-60 Units Produced <u>After</u> 3/31/03

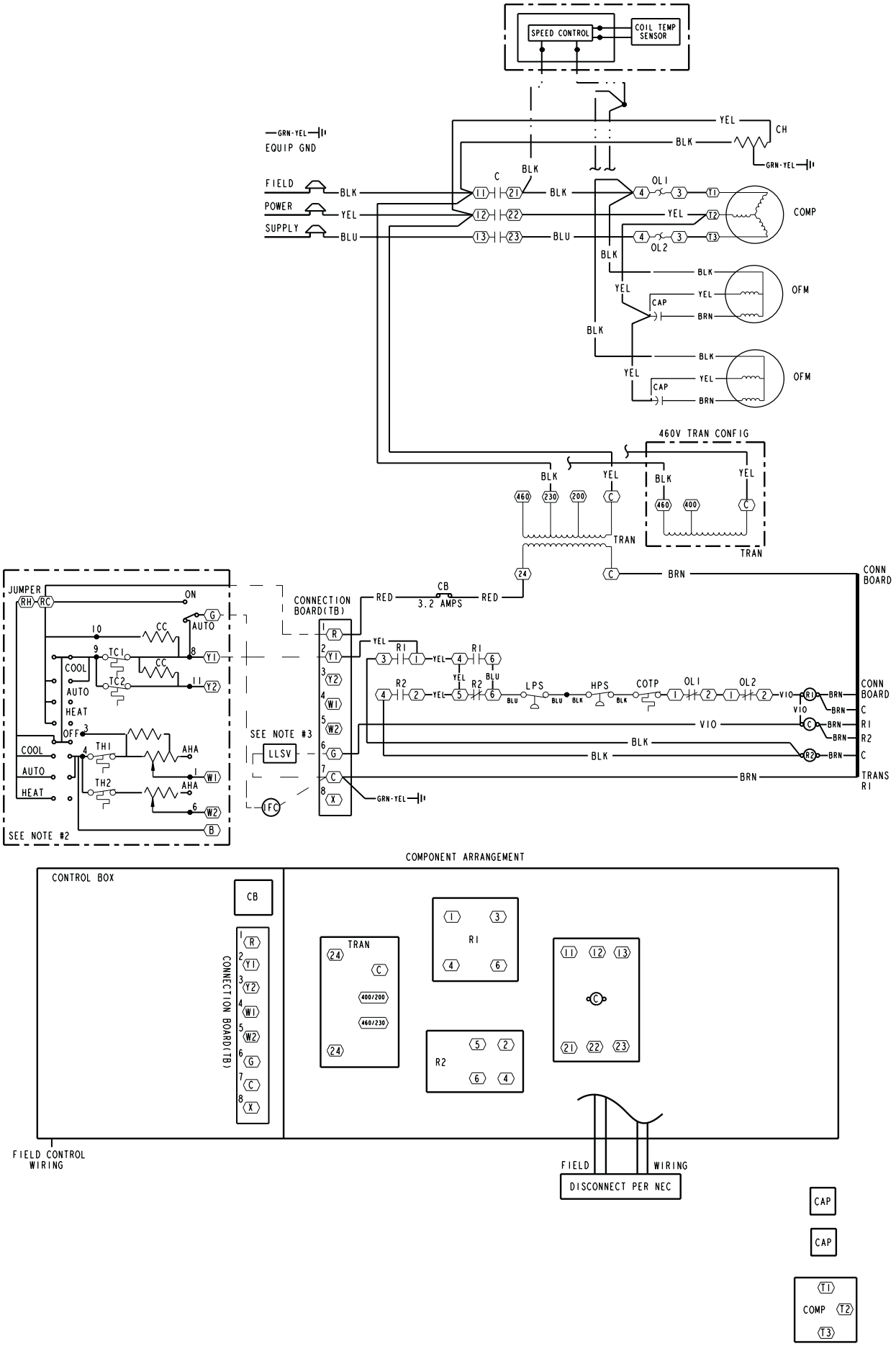


Fig. 9 — Label Diagram — 576C090-120, 208/230-3-60, 460-3-60 Units Produced Before 3/31/03

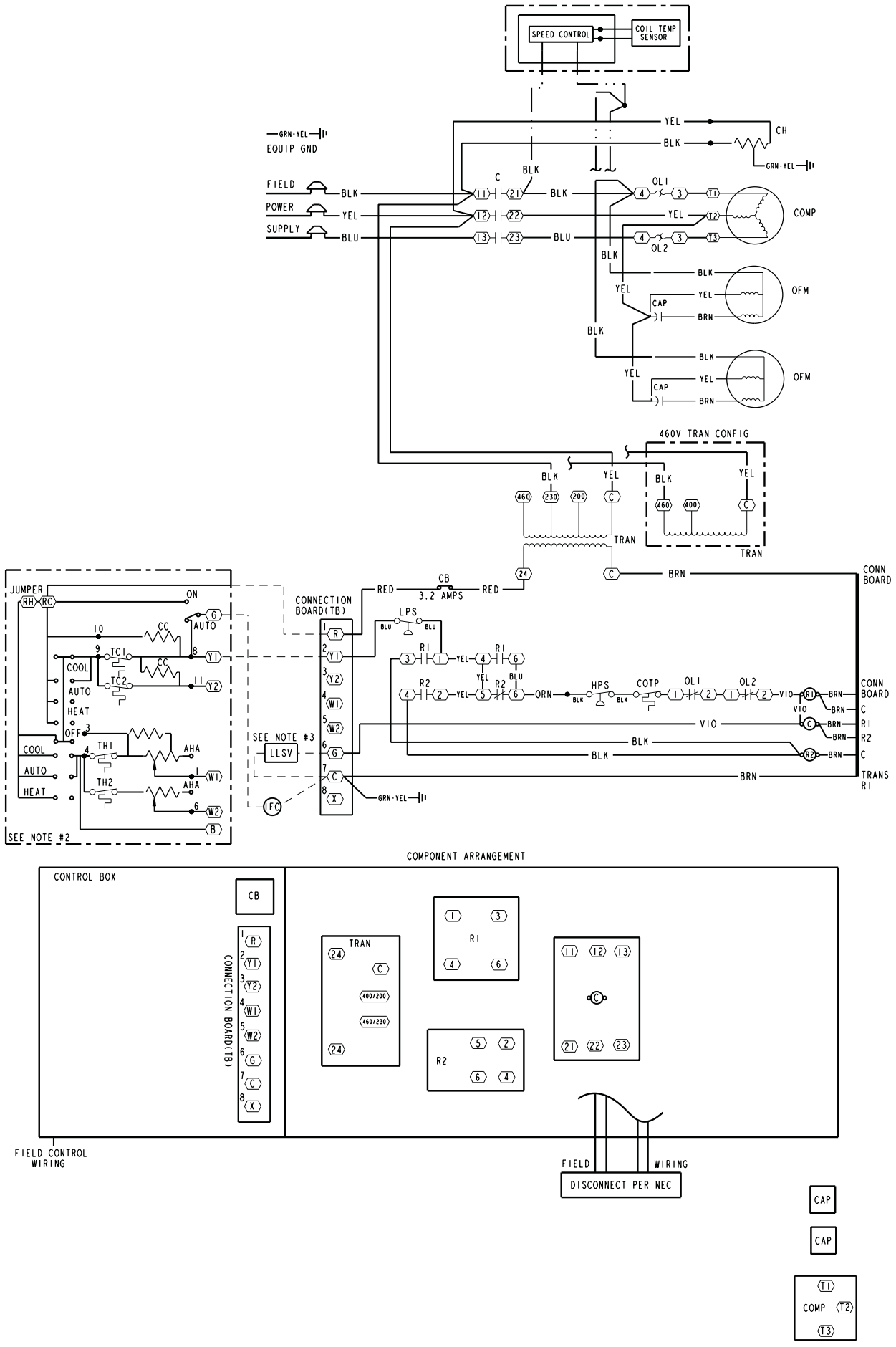


Fig. 10 — Label Diagram — 576C090-120, 208/230-3-60, 460-3-60 Units Produced <u>After</u> 3/31/03

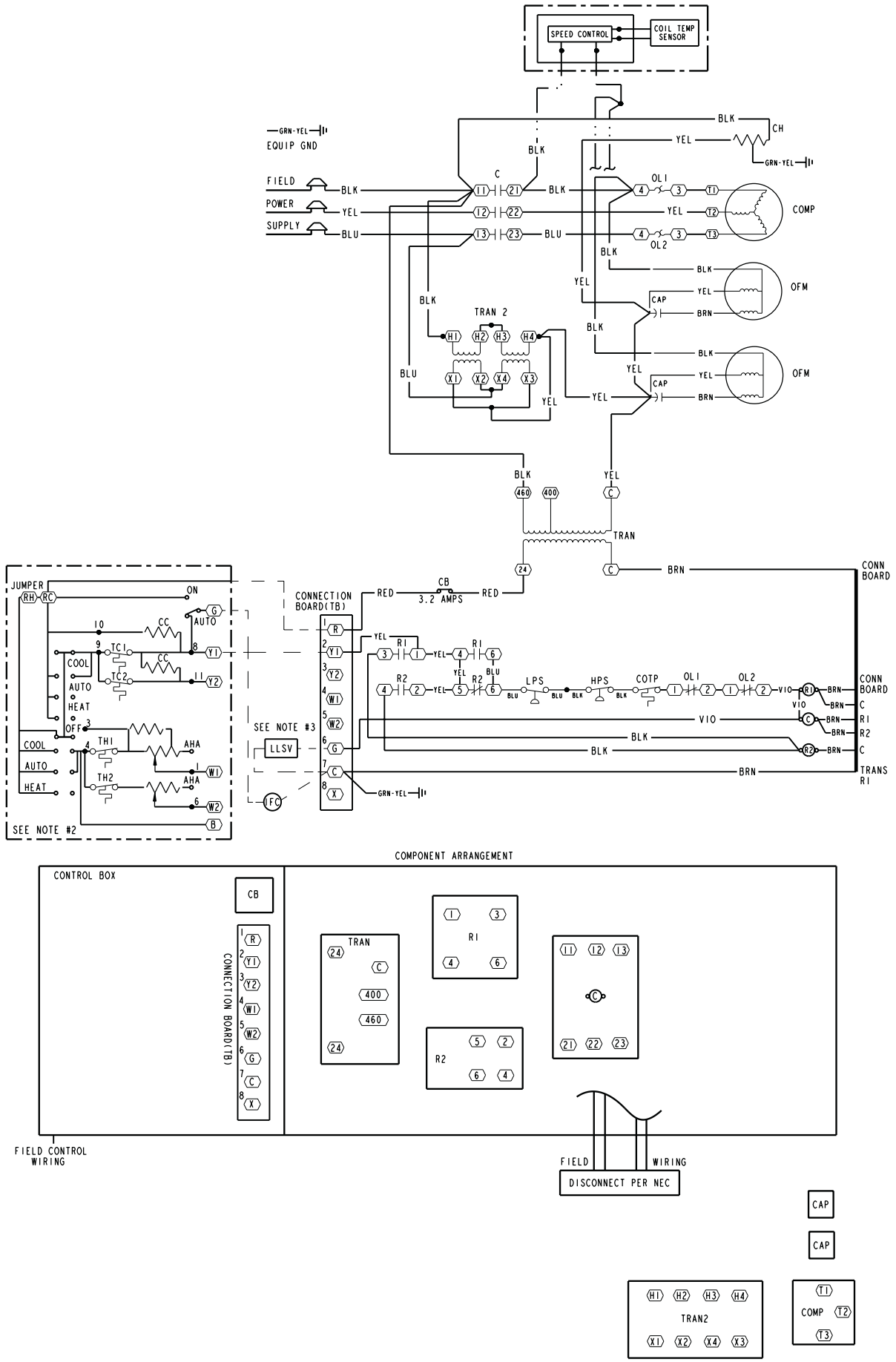


Fig. 11 — Label Diagram — 576C090-120, 575-3-60 Units Produced Before 3/31/03

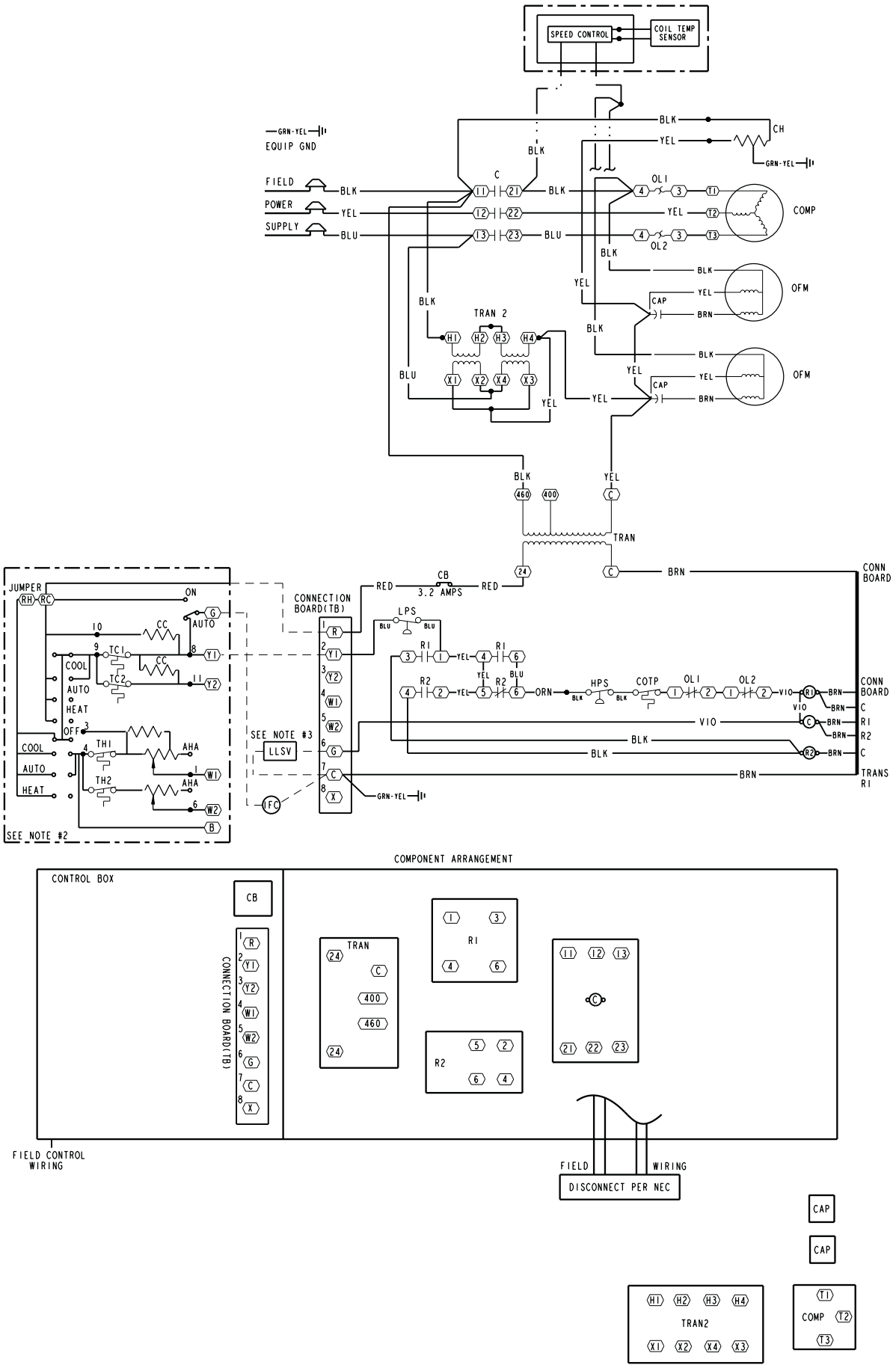


Fig. 12 — Label Diagram — 576C090-120, 575-3-60 Units Produced After 3/31/03

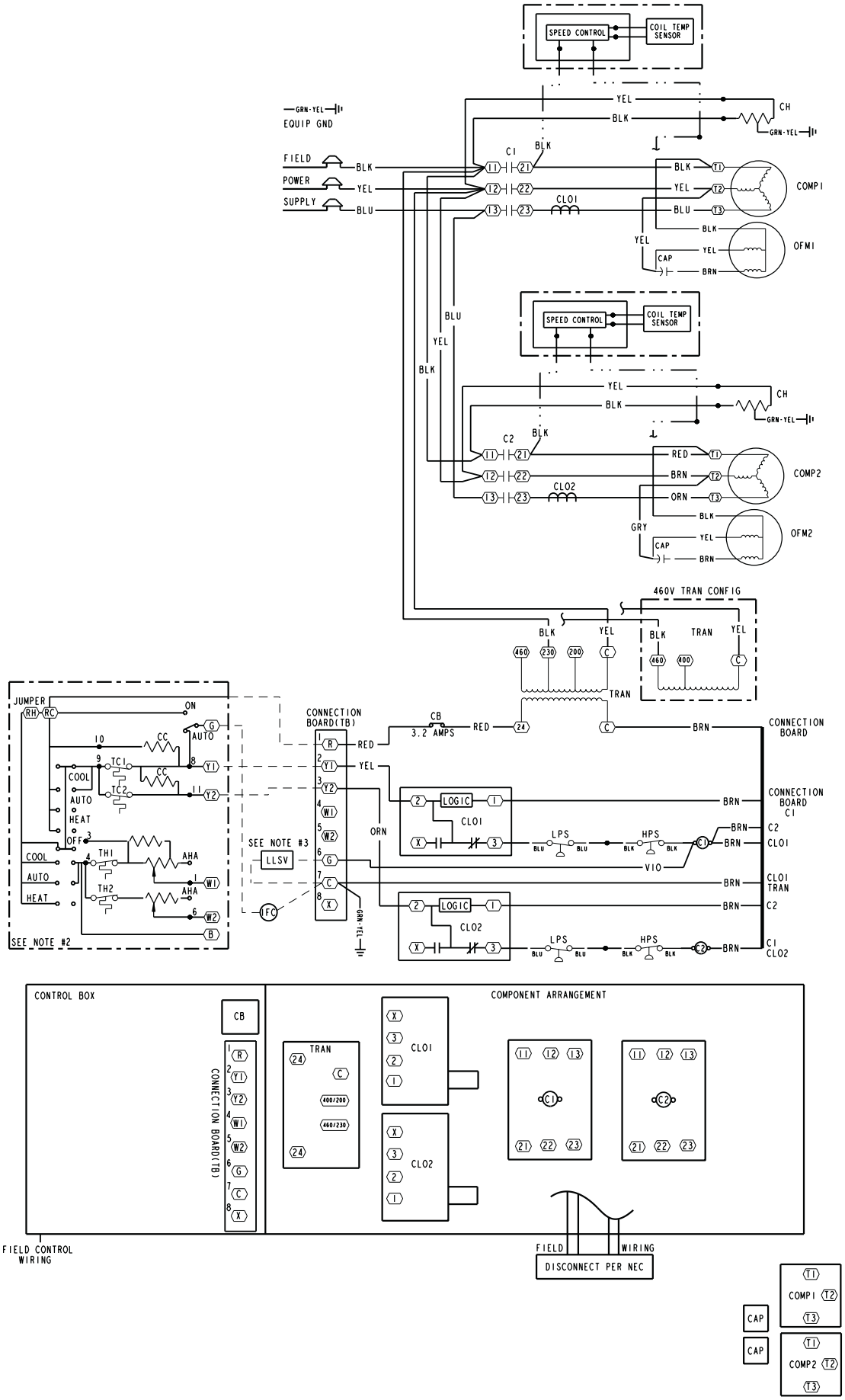


Fig. 13 — Label Diagram — 569F120, 208/230-3-60, 400/460-3-60 Units Produced Before 3/31/03

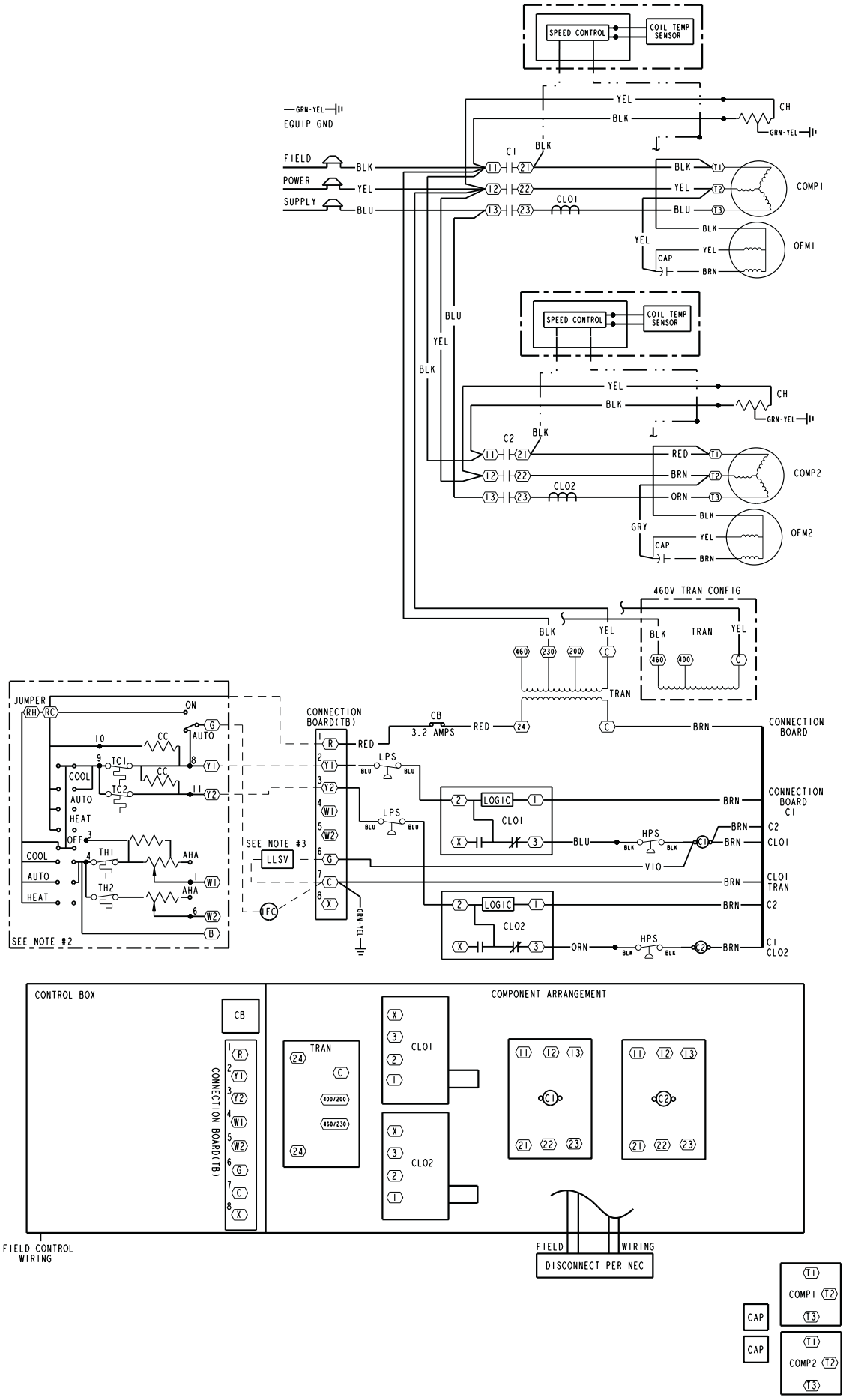


Fig. 14 — Label Diagram — 569F120, 208/230-3-60, 400/460-3-60 Units Produced After 3/31/03

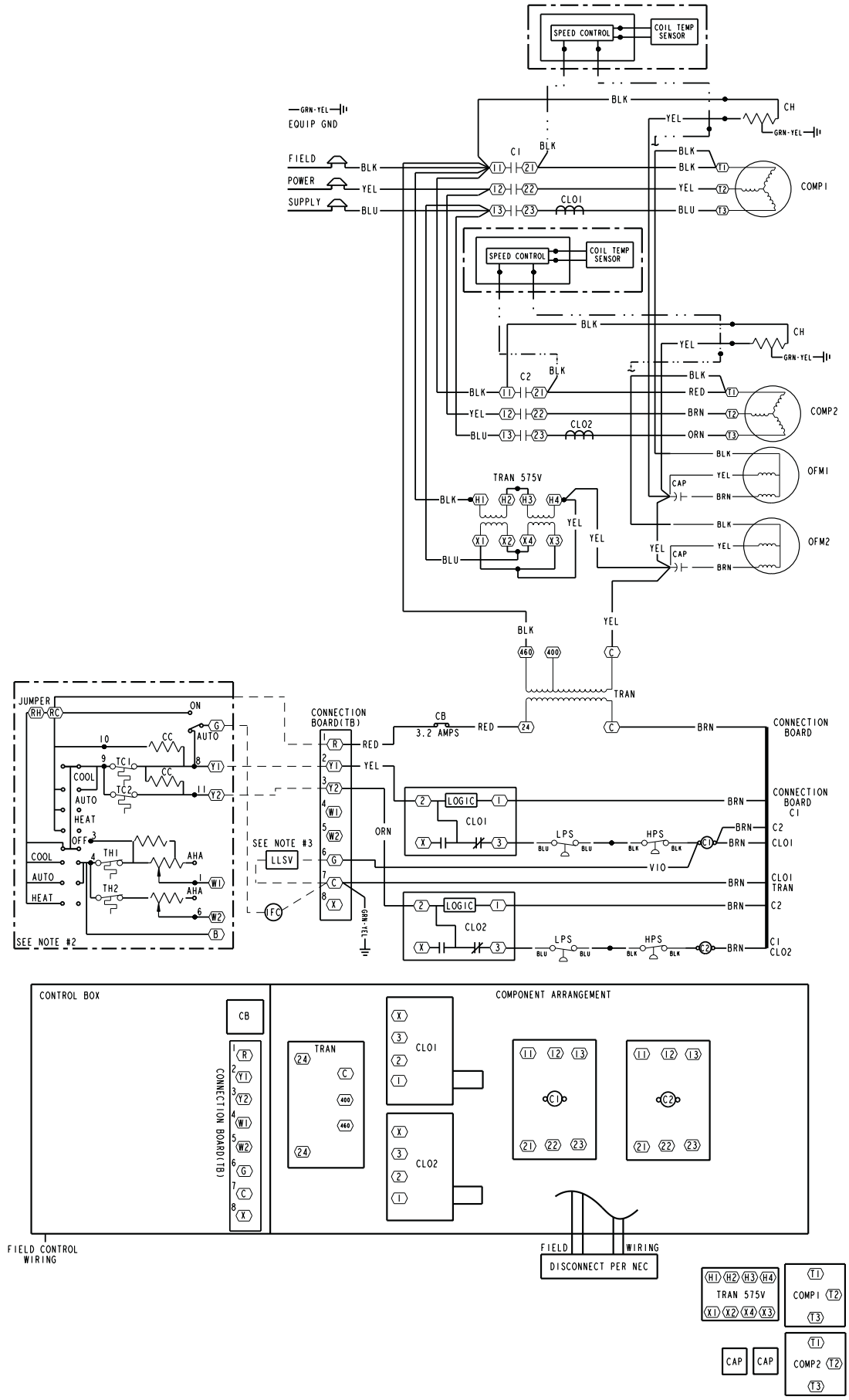


Fig. 15 — Label Diagram — 569F120, 575-3-60 Units Produced Before 3/31/03

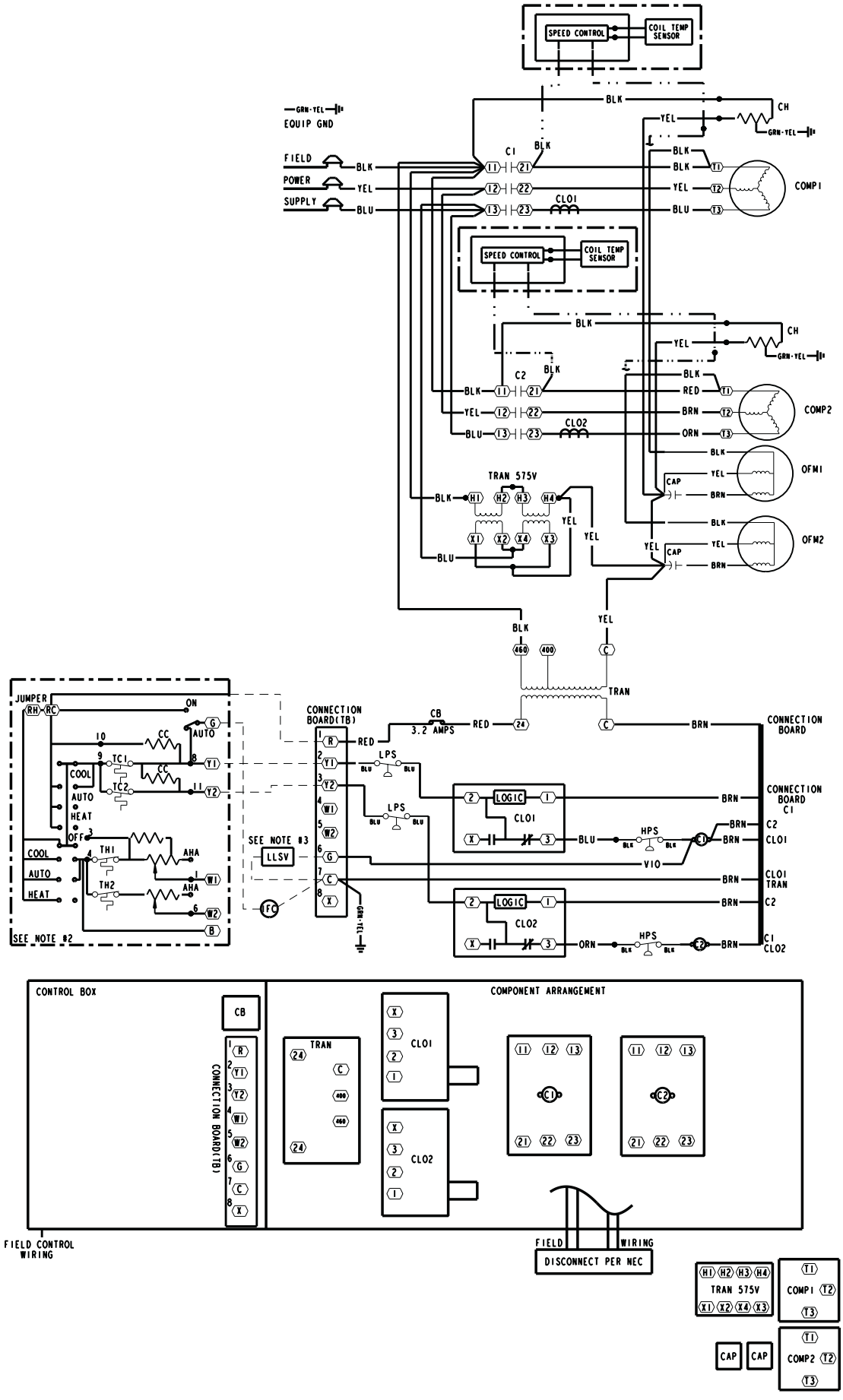


Fig. 16 — Label Diagram — 569F120, 575-3-60 Units Produced After 3/31/03

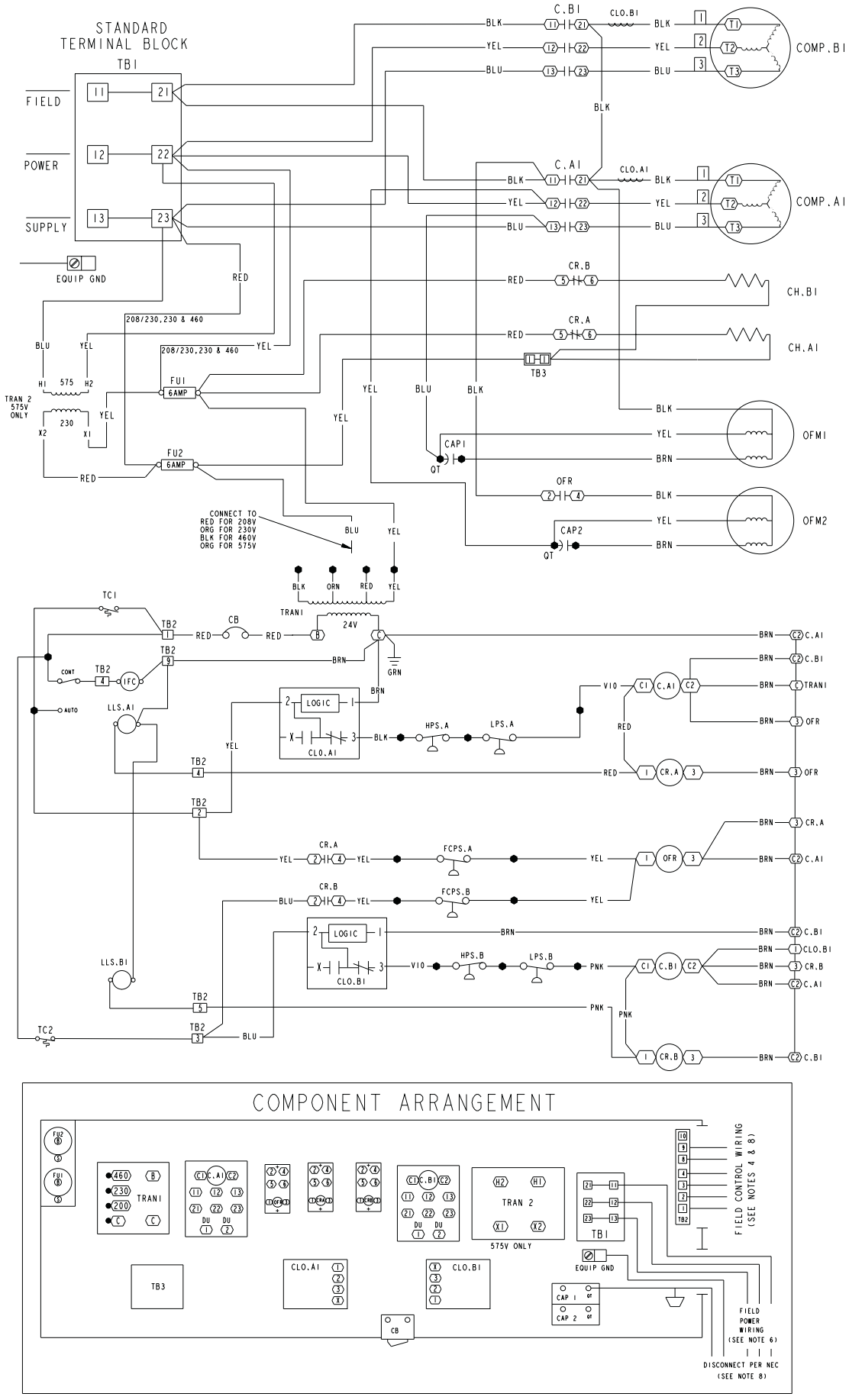


Fig. 17 — Label Diagram — 566E150-240, 208/230-3-60, 400/460-3-60 and 575-3-60 Units

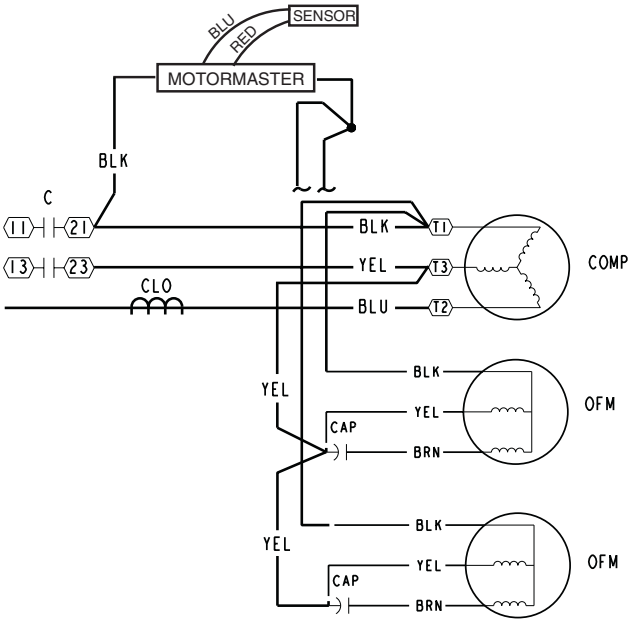


Fig. 18 — Motormaster® Control Wiring Details — 569D072-120 Units

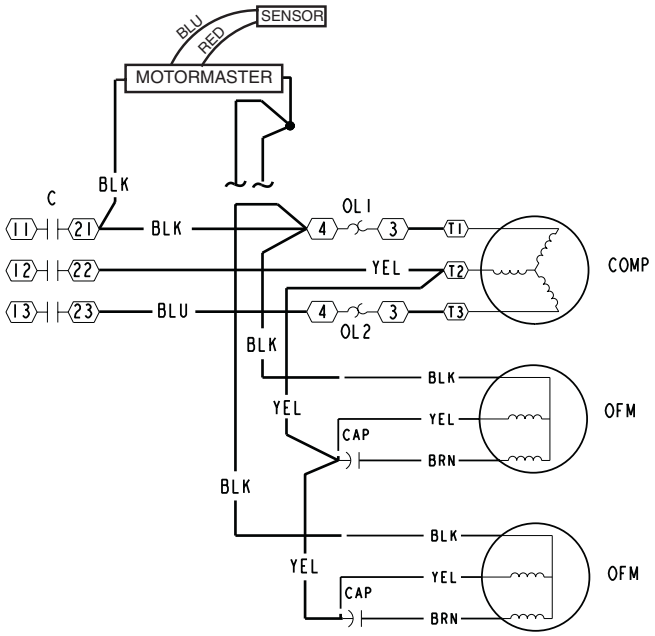
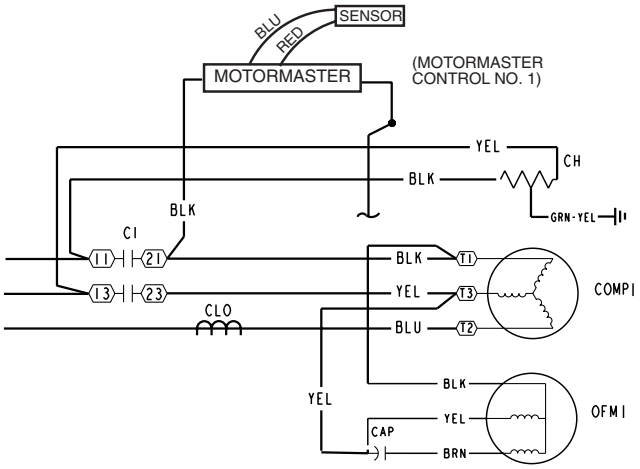
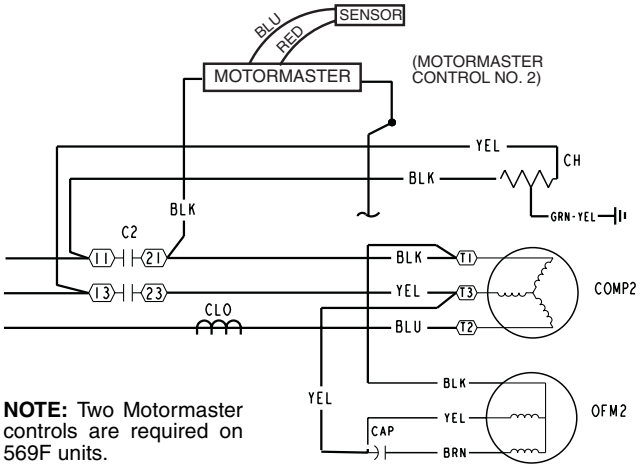


Fig. 19 — Motormaster Control Wiring Details — 576C090-120 Units





NOTE: Two Motormaster controls are required on 569F units.

Fig. 20 — Motormaster Control Wiring Details — 569F120 Units

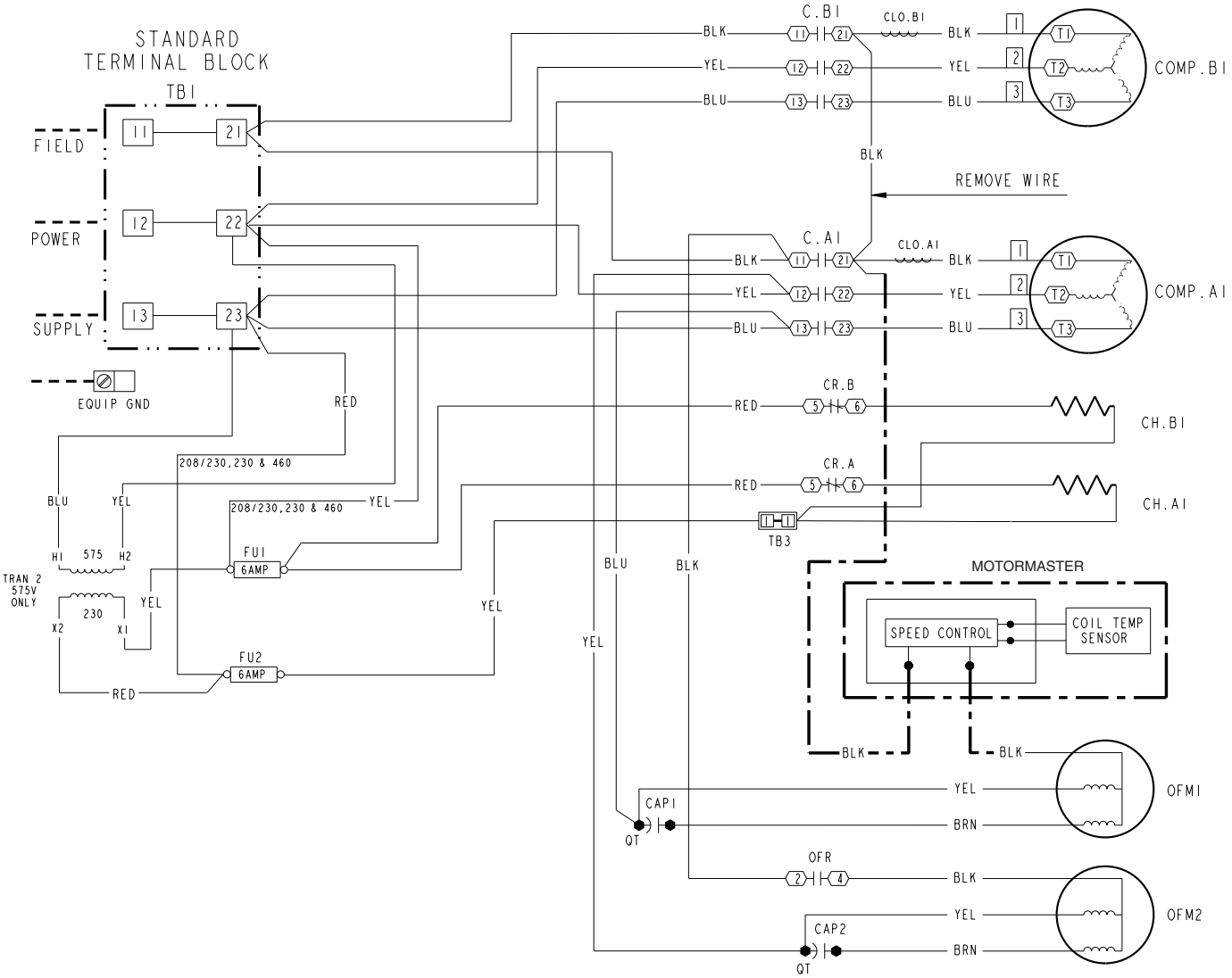


Fig. 21 — Motormaster® Control Wiring Details — 566E150-240 Units

OPERATING SEQUENCE

569D072-120, 576C090-120 Units

At start-up, the thermostat calls for cooling. With all safety devices satisfied, the compressor contactor and fan contactor energize, causing the compressor and outdoor-fan motor to operate. Thermostat contacts energize, allowing the field-supplied and field-installed indoor-fan contactor to function. A field-supplied and field-installed liquid line solenoid valve also opens, allowing the system to function in Cooling mode. As cooling demand is satisfied, the thermostat contacts break, deenergizing the contactor and causing the system to shut off. The liquid line solenoid valve closes, minimizing the potential for refrigerant migration. The compressor does not restart until the thermostat again calls for cooling. The system is protected with a safety circuit so that the system will not start if a fault exists (i.e., high or low pressure fault). To reset the safety circuit, set the thermostat to eliminate the cooling demand, then return to original set point. This should be done only once, and if system shuts down due to the same fault, determine the problem before attempting to restart the system.

569F120 Units

When the thermostat calls for stage one cooling at start-up, and all safety devices are satisfied, the compressor contactor 1 (C1) energizes causing compressor no. 1 and outdoor-fan motor no. 1 to start (the indoor-fan contactor should be wired to start at the same time as the compressor). The liquid line solenoid (LLS) valve will open when compressor no. 1 starts, allowing refrigerant to flow in the system.

When the thermostat calls for stage two cooling, compressor contactor no. 2 (C2) energizes causing compressor no. 2 and outdoor-fan motor no. 2 to start. As the cooling demand decreases, stage two on the thermostat opens, causing compressor no. 2 and outdoor-fan motor no. 2 to shut down. As the cooling continues to decrease, stage one of the thermostat opens causing compressor no. 1 and outdoor-fan motor no. 1 to shut down. The LLS valve for each compressor will close when the associated compressor stops, minimizing the potential for refrigerant migration during the off cycle.

The indoor-fan motor will stop if the thermostat is set to AUTO and will continue to operate if the thermostat is set to CONT. Each compressor is protected with a Cycle-LOC™ device so that the compressor will not operate if there is a high-pressure fault, low-pressure fault, or a compressor is off due to internal line break overcurrent/over temperature protection. To reset the Cycle-LOC device, set the thermostat higher to remove the cooling demand, then return to the original set point. This should be done only once. If the system shuts down with the same fault, the cause for the fault should be determined and corrected before the a Cycle-LOC device is reset again.

566E150-240 Units

At start-up, when the thermostat calls for first stage cooling and all safety devices are satisfied, the compressor contactor (C1) energizes causing compressor one and fan motor one to start. Fan motor no. 2 will start when the fan cycling pressure switch (FCPS) closes as discharge pressure builds. With the indoor-fan contactor wired to TB2-4 and TB2-9 contacts on the terminal block, the indoor-fan will also start with the compressor. The liquid line solenoid (LLS) valve will open when compressor no. 1 starts, allowing refrigerant to flow in the system.

When the thermostat calls for stage two cooling, compressor contactor no. 2 (C2) energizes causing compressor no. 2 to start. As the cooling demand decreases, stage two on the thermostat opens, causing compressor no. 2 to shut down. As the cooling continues to decrease, stage one of the thermostat opens causing compressor no. 1 and outdoor-fan motor to shut down. The LLS valve for each compressor will close when the associated compressor stops, minimizing the potential for refrigerant migration during the off cycle.

The indoor-fan motor will stop if the thermostat is set to AUTO and will continue to operate if the thermostat is set on CONT. Each compressor is controlled by the thermostat so they will not start until there is a demand from the thermostat. Each compressor is protected with a Cycle-LOC device so that the compressor will not operate if there is a high-pressure fault, low-pressure fault, or compressor is off due to internal line break overcurrent/overtemperature protection. To reset the a Cycle-LOC device, set the thermostat higher to remove the cooling demand, then return to the original set point. This should be done only once. If the system shuts down with the same fault, the cause for the fault should be determined and corrected before the a Cycle-LOC device is reset again.

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